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Inadequate Ventilation System, Finger Lake School

A new school in Wasilla, Finger Lake Elementary, opened in the fall of 1986--the daytime home of approximately 400 students and 35 staff. In January, 1987 some teachers began to experience a wide variety of symptoms of illness including headache, abdominal pain, nausea, queasiness, itchy, burning or runny eyes, sneezing, shortness of breath or troubled breathing, dizziness, sore throat, and difficulty concentrating which they felt were work related. A kerosene-like odor was noticed in parts of the school.

Based upon these complaints, in April, 1987 the school district requested the State Department of Labor (OSHA) conduct a safety/health evaluation. OSHA's report concluded that the most probable source of the odor was the fire-proofing material above the first floor. Air samples were tested for small and long chain hydrocarbons, benzene, toluene, formaldehyde, and other organics. All levels were well below permitted exposure levels for industrial settings. For example, the concentration of formaldehyde (0.01 parts per million) was 1/100th of the permitted exposure for this chemical (1.0 ppm). OSHA recommended applying a sealant over the fire-proofing, "baking-out" the building, and investigating possible classroom ventilation problems.

During May and June, 1987 the school district and the borough public works department examined the ventilation system. After minor adjustments and corrections, they felt the system was operating as designed. During the summer of 1987, the district increased the heat in the building and ran the ventilation system in order to "bake-out" the building.

Shortly after school opened in the fall of 1987, however, employee complaints resumed. In addition, parents complained that their children were developing headache, dizziness, abdominal pain, sneezing, cough, and runny or itchy eyes in school. In November, OSHA completed an additional evaluation documenting exhaust air flow out of a return air duct into one of the classrooms. The OSHA recommendation to apply sealant over the fire-proofing was completed during December, 1987. In January and February, 1988 complaints of odor and illness continued.

Epidemiologic investigations revealed:

1. There were essentially no differences in the rate or pattern of absenteeism for either the staff or students at Finger Lake compared to two other elementary schools.
2. Our research into the toxicology of the fire-proofing material, the petroleum process oil contained in it, and the sealant sprayed over the fire-proofing was reassuring that no long- or short-term adverse health effects would be expected.
3. Testing of air and fire-proofing samples from the school by the National Institute of Occupational Safety and Health (NIOSH) in Cincinnati, Ohio, showed that the odor at the school was, as suspected, from the fire-proofing.
4. Consultants from the State Department of Environmental Conservation, the State Department of Labor, and a private consultant hired by the borough studied the ventilation system and found that return air (exhaust) was flowing into some classrooms and that fresh (outside) air supply was inadequate.

The private consultant recommended a series of modifications to temporarily correct the deficiencies in the air system until the end of the current school year. Permanent modifications will be made over the summer. After the temporary modifications were implemented, there was a noticeable increase in air flow in the building. Reports of odor and illness have dramatically declined.

The Section of Epidemiology will continue to maintain surveillance and to assure that the ventilation problems are resolved. Open communication is essential. The school district and parent committee, formed to review findings and recommendations, should continue to meet regularly until all problems are resolved.